Title: DUAL USE RATE POLICER AND RE-MARKING LOGIC
Inventor Name: Andrew V. Hoar, et al
Appl. No. UNASSIGNED
Docket No.: CRESC-003XX

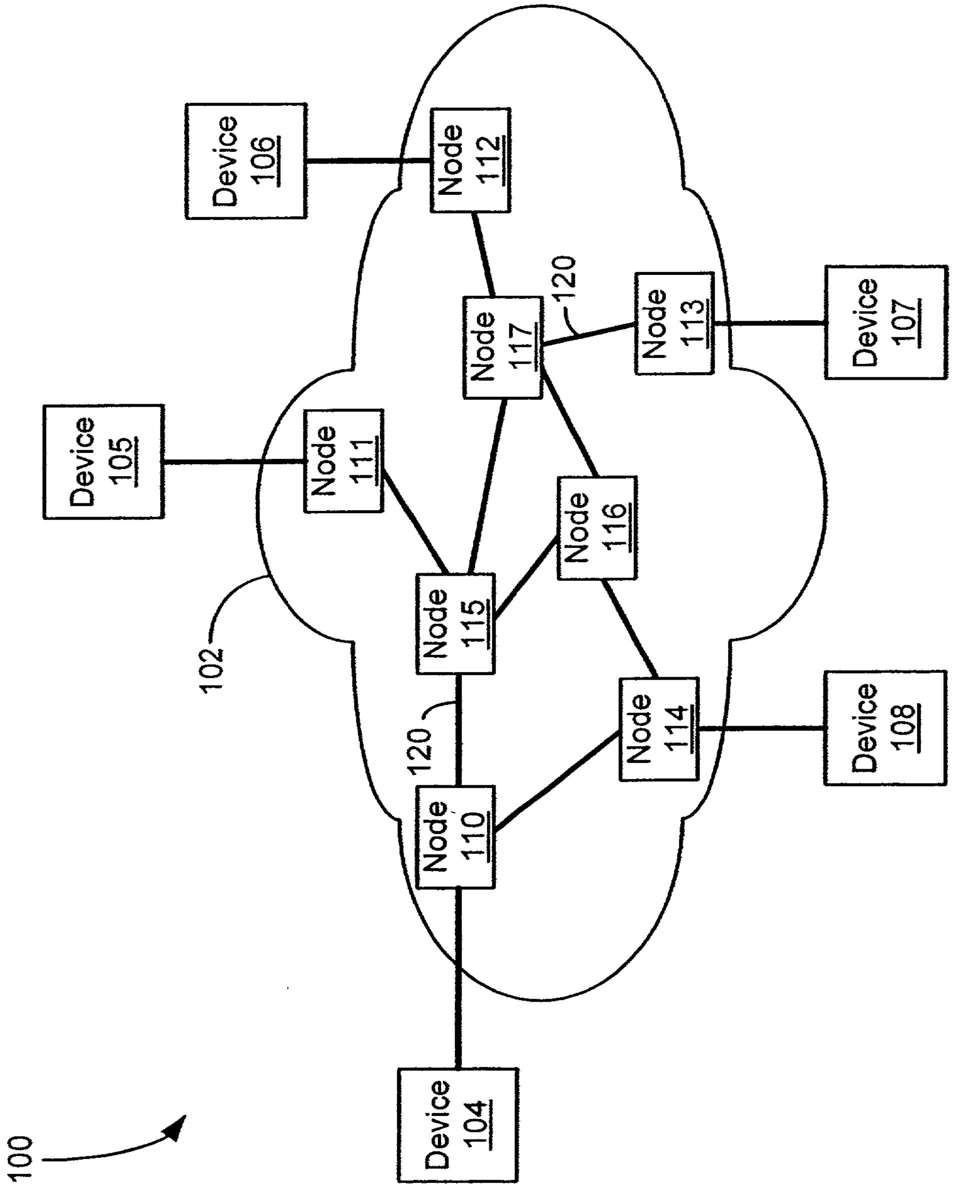

Fig. 1

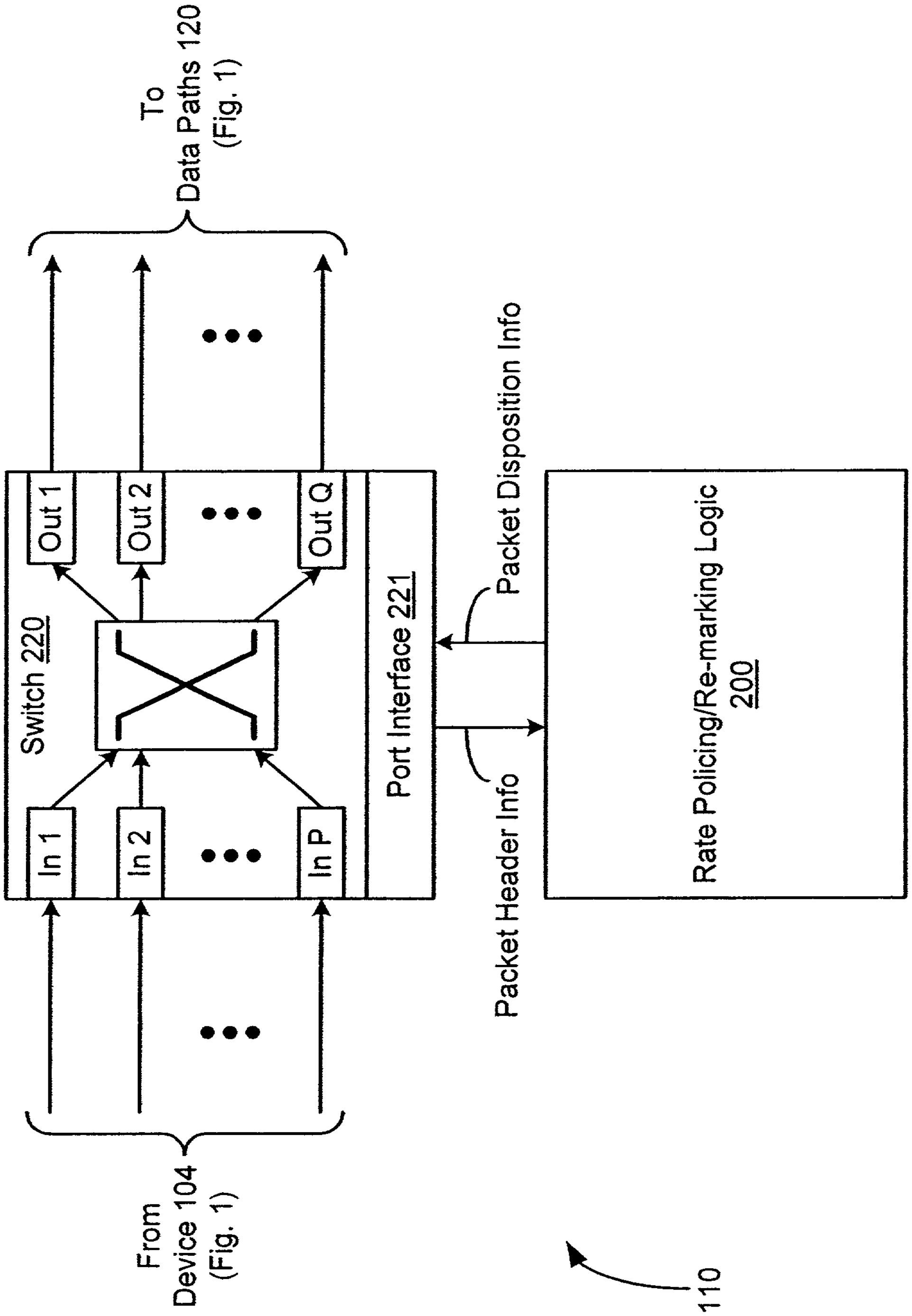
To
Data Paths 120
(Fig. 1)
Out 1
Out 2
Out Q
Switch 220
In 1
In 2
In P
Port Interface 221
Packet Disposition Info
Packet Header Info
Rate Policing/Re-marking Logic
200
From
Device 104
(Fig. 1)
110

Fig. 2

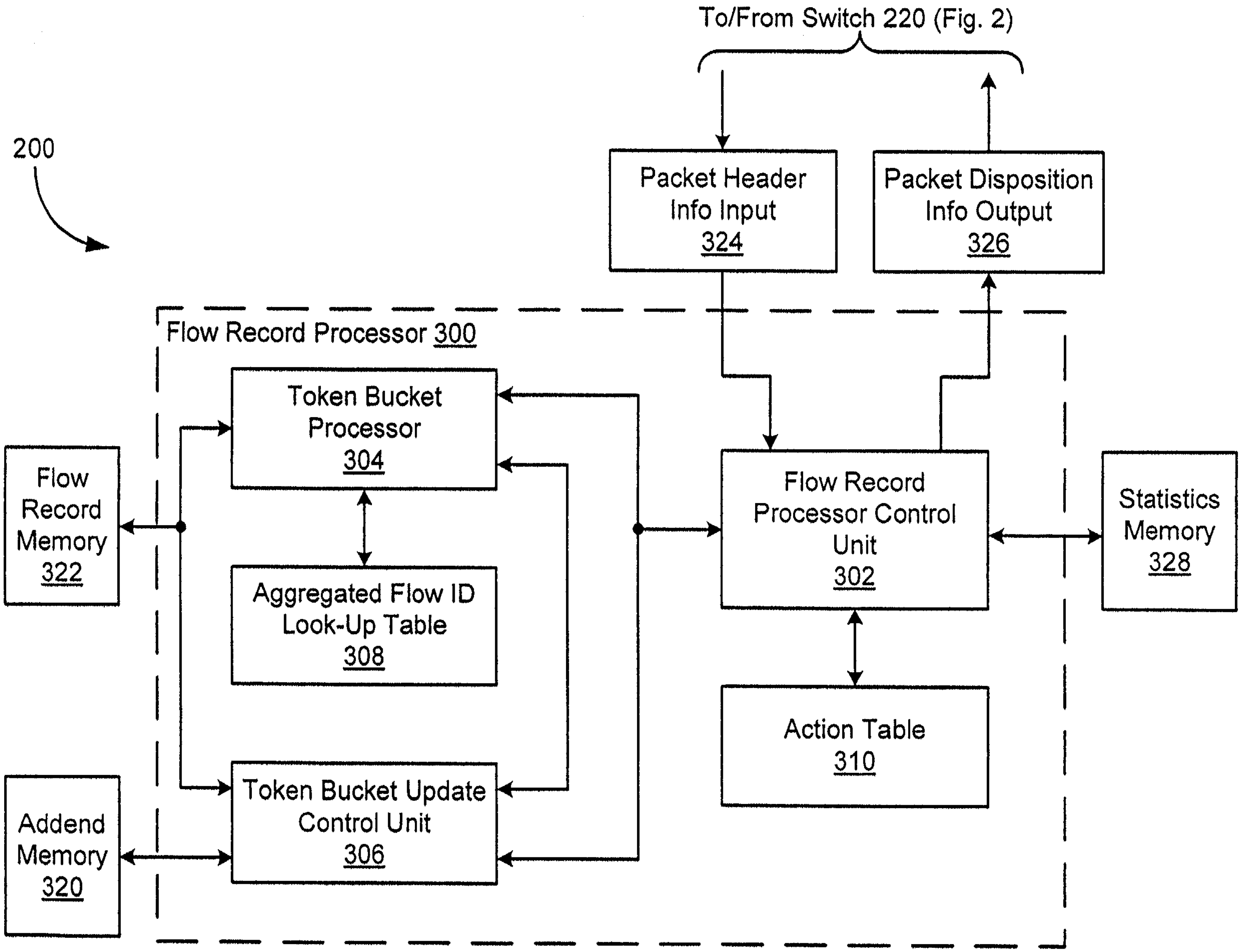
To/From Switch 220 (Fig. 2)
200
Packet Header Info Input 324
Packet Disposition Info Output 326
Flow Record Processor 300
Token Bucket Processor 304
Aggregated Flow ID Look-Up Table 308
Token Bucket Update Control Unit 306
Flow Record Processor Control Unit 302
Action Table 310
Statistics Memory 328
Flow Record Memory 322
Addend Memory 320

Fig. 3

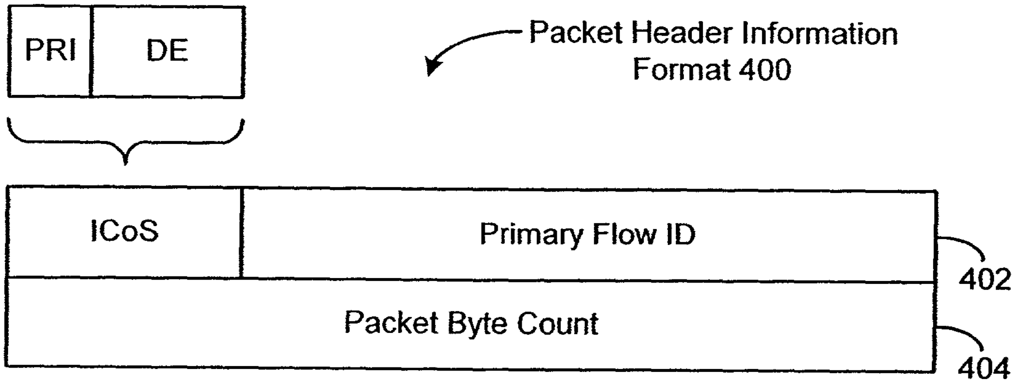
PRI
DE
Packet Header Information
Format 400
ICoS
Primary Flow ID
402
Packet Byte Count
404

Fig. 4

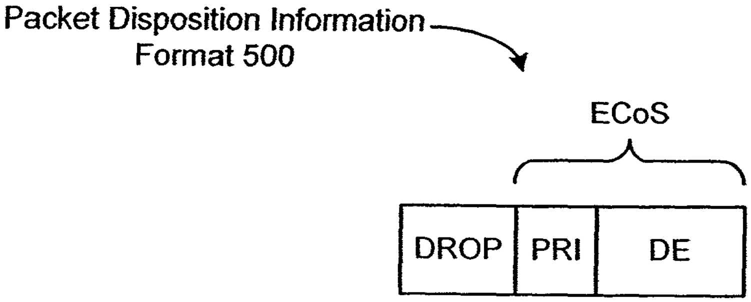
Packet Disposition Information
Format 500
ECoS
DROP
PRI
DE

Fig. 5

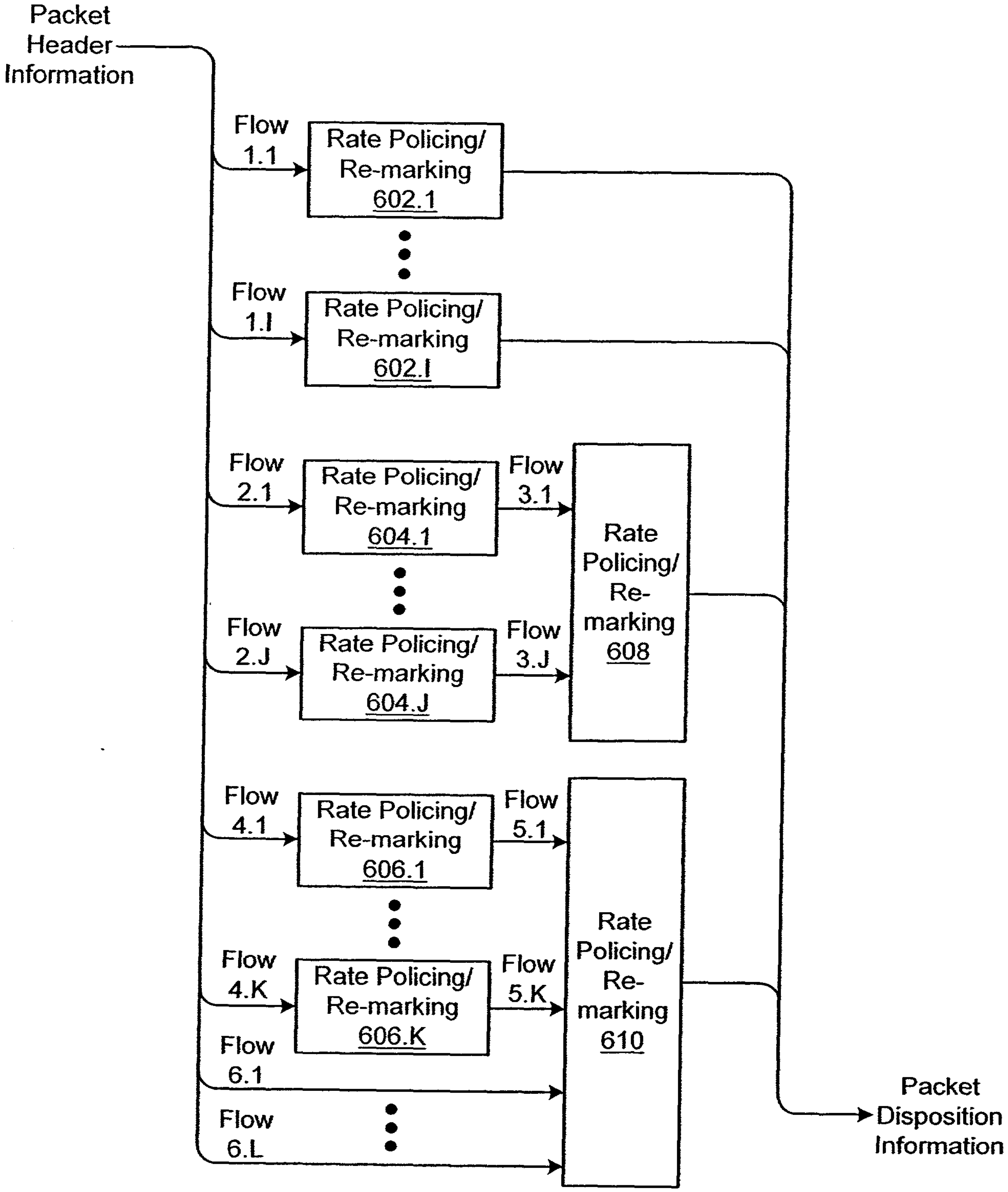
Packet Header Information
Flow 1.1
Rate Policing/ Re-marking 602.1
Flow 1.I
Rate Policing/ Re-marking 602.I
Flow 2.1
Rate Policing/ Re-marking 604.1
Flow 3.1
Flow 2.J
Rate Policing/ Re-marking 604.J
Flow 3.J
Rate Policing/ Re-marking 608
Flow 4.1
Rate Policing/ Re-marking 606.1
Flow 5.1
Flow 4.K
Rate Policing/ Re-marking 606.K
Flow 5.K
Flow 6.1
Flow 6.L
Rate Policing/ Re-marking 610
Packet Disposition Information

Fig. 6

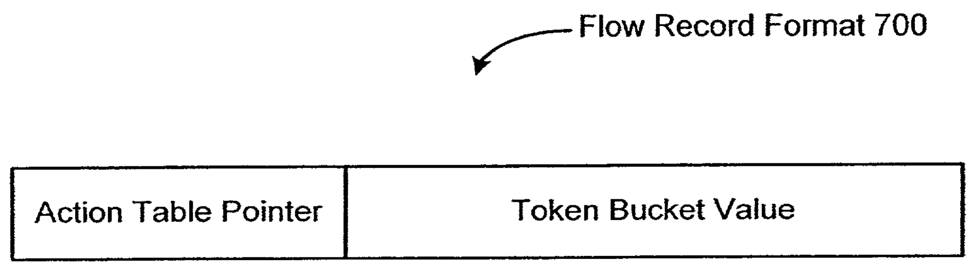

Fig. 7

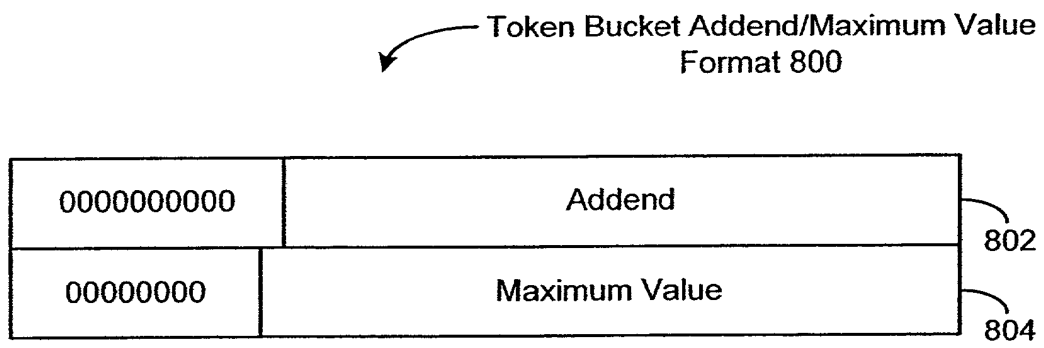

Fig. 8

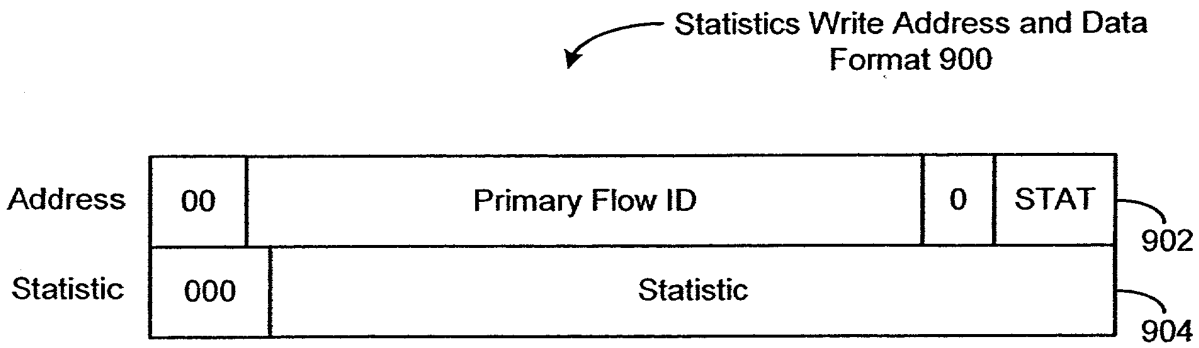

Fig. 9

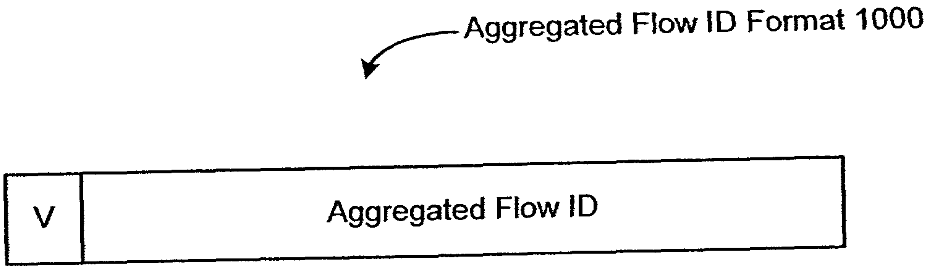
Aggregated Flow ID Format 1000
V
Aggregated Flow ID

Fig. 10

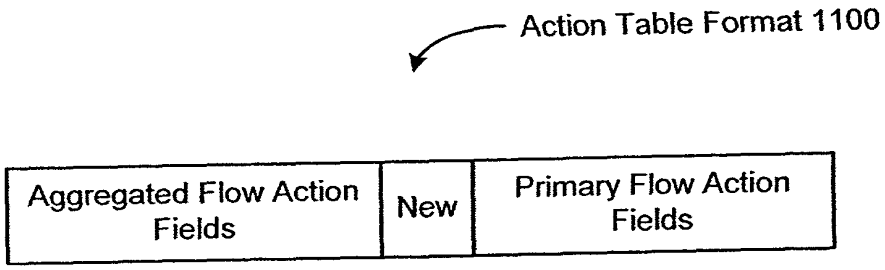
Action Table Format 1100
Aggregated Flow Action Fields
New
Primary Flow Action Fields

Fig. 11

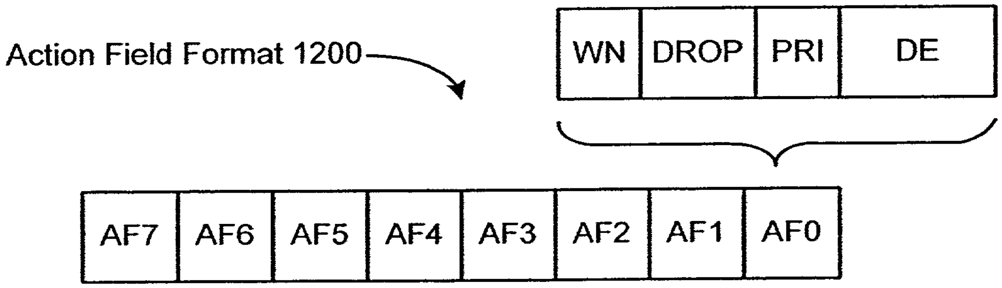
Action Field Format 1200
WN
DROP
PRI
DE
AF7
AF6
AF5
AF4
AF3
AF2
AF1
AF0

Fig. 12

```
Label: GetNextPacket        // From Packet Header Input
B = PacketByteCount
CCOS = ClassofServiceofPacket
NCCOS = NewClassofService
NCCOS = CCOS

// Use PrimaryFlowID to look-up primary token bucket flow record and
// AggregatedFlowID
PTB = TokenBucket(PrimaryFlowID)
ATB = TokenBucket(AggregatedFlowID)
ATP = ActionTablePointer(PrimaryFlowID)
V = ValidBit(PrimaryFlowID)
AFID = AggregatedFlowID(PrimaryFlowID)

// Use the ATP to get the current action table entry
AT1 = ActionTableLow(ATP) // Primary Action Table Entry
UseNewCos = ActionTableNew(ATP) // Action Table New Bit
AT2 = ActionTableHigh(ATP) // Aggregated Action Table Entry

// Perform the primary token bucket test
If PTB - B < 0;
        If Drop(AT1, CCOS) = True;
                Drop the packet;
                go to GetNextPacket;
        else
                NCCOS = NewCCOS(AT1, CCOS);
                If WholeNumber(AT1, CCOS) = False;
                        PTB = PTB - B;
else
        PTB = PTB - B;
```

Fig. 13a

```
// Check the valid bit of the AggregatedFlowID
If V = False;
        Write NCCOS into egressPacketHeader;
        go to GetNextPacket;
else    // Use AggregatedFlowID to look-up aggregated token bucket
        // flow record
        If UseNewCCOS = True;
                CCOS = NCCOS;
        // Perform the aggregated token bucket test
        If ATB - B <0;
                If Drop(AT2, CCOS) = True;
                        Drop the packet;
                        go to GetNextPacket;
                else
                        NCCOS = NewCCOS(AT2, CCOS)
                        If WholeNumber(AT2, CCOS) = False;
                                ATB = ATB - B;
        else
                ATB = ATB - B;
        Write NCCOS into egressPacketHeader;
        go to GetNextPacket;
```

Fig. 13b